Apppendix A

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Attorney Docket Number: 3272
Title: Methods, Systems and Software for Pixel Stutter Detection

```
/////////////////////////////////////////////////////////////////////////////
void CDatToolDlg::TagStutter()
{

        //Create output dat file
        ImageData * pOutputImg;
        pOutputImg = new ImageData;
        pOutputImg->SetName(this->m_OutputFile);
        pOutputImg->Create(m_pInputImage->xSize(),m_pInputImage->ySize());
        pOutputImg->SetSize(m_pInputImage->xSize(),m_pInputImage->ySize());

        //Copy input dat file to output dat file
        this->CopyImage(pOutputImg,m_pInputImage);

        //A few local variables
        unsigned short * inputDataPointer=m_pInputImage->GetDataPtr();
        unsigned short * outputDataPointer=pOutputImg->GetDataPtr();
        int numCols=m_pInputImage->xSize();
        int nStutter=0,iRowStart,iRowEnd,iColStart,iColEnd;

        if (m_StutterArea == ENTIRE_IMAGE)
        {
                iRowStart=0;
                iRowEnd=m_pInputImage->ySize()-1;
                iColStart=0;
                iColEnd=m_pInputImage->xSize()-1;
        }
        else
        {
                //Does the input image have a valid grid?
                if ( (m_pInputImage->CellGrid.lowerleft.y > 0) && (m_pInputImage->CellGrid.lowerleft.x > 0))
                {
                        //yes, valid grid

                        iRowStart=__max(m_pInputImage->CellGrid.upperleft.y,m_pInputImage-
>CellGrid.upperright.y);
                        iRowEnd= __min(m_pInputImage->CellGrid.lowerleft.y,m_pInputImage-
>CellGrid.lowerright.y);

                        iColStart=__max(m_pInputImage->CellGrid.upperleft.x,m_pInputImage-
>CellGrid.lowerleft.x);
                        iColEnd=__min(m_pInputImage->CellGrid.upperright.x,m_pInputImage-
>CellGrid.lowerright.x);
                }
                else
                {
                        //no, invalid grid
                        AfxMessageBox("Operation Canceled due to invalid grid");

                        //Dispose memory
                        delete pOutputImg;
                        pOutputImg=NULL;

                        return;
                }
        }
```

```
if (m_StutterDirection==HORIZONTAL_STUTTER)
{
        //For all the image pixels
        for (int iRow=iRowStart;iRow <=iRowEnd;iRow++)
{
                //Get A row of the input image
                int iRowOffset=iRow * numCols;

                //Get the first pixel value in the row
                inputDataPointer=m_pInputImage->GetDataPtr();
                unsigned short iPixValue=inputDataPointer[iRowOffset+iColStart];

                //Walk across the row
                for ( int iCol=iColStart+1;iCol <= iColEnd;iCol++)
                {
                        //If the pixel is identical to the next pixel, then set both pixels to the
stutter replacement value
                        if (inputDataPointer[iRowOffset + iCol] == iPixValue)
                        {
                                nStutter++;
                                outputDataPointer[iRowOffset + iCol] = m_StutterReplace;
                                outputDataPointer[iRowOffset + iCol-1] = m_StutterReplace;
                        }
                        else
                        {
                                //do nothing
                        }

                        //move on
                        iPixValue=inputDataPointer[iRowOffset+iCol];
                }
        }
}
else
{

        //Vertical stutter
        //For all the image pixels
        for (int iCol=iColStart;iCol<=iColEnd;iCol++)
        {
                //For each column, walk the row
                int iOffsetPrev=iRowStart*numCols + iCol;
                unsigned short iPixValuePrev = inputDataPointer[iOffsetPrev];


                //Walk down the column
                for (int iRow=iRowStart+1; iRow <= iRowEnd; iRow++)
                {
                        int iOffset=iRow*numCols + iCol;
                        unsigned short iPixValue=inputDataPointer[iOffset];
                        //If the pixel is identical to the previous pixel value, then set both pixels to
the stutter replacement value
                        if (iPixValue == iPixValuePrev)
                        {
                                nStutter++;
                                outputDataPointer[iOffsetPrev]=m_StutterReplace;
                                outputDataPointer[iOffset]=m_StutterReplace;

                        }
                        else
                        {
                                //do nothing
                        }

                        //move on
                        iOffsetPrev=iOffset;
                        iPixValuePrev=iPixValue;
                }

        }

    }
```

```cpp
        //Write the dat file.
        if (!pOutputImg->Write())
        {
                AfxMessageBox(IDS_ERRORWRITE);
        }
long lSize=m_pInputImage->xSize()*m_pInputImage->ySize();
        long replacedPixels=2*nStutter;
        float stutterRatio=(float(nStutter))/float(lSize);

        //Report
        CString outString1,outString2;
        outString1.Format("Stutter Report for %s\nOutput Image: %s\n",m_pInputImage->GetName(),pOutputImg-
>GetName());


        if (m_StutterArea==ENTIRE_IMAGE)
        {
                outString2="Area Analyzed is Entire Image\n";
        }
        else
        {
                outString2.Format("Area Analyzed is Rows: %d to %d and  Cols: %d to
%d\n",iRowStart,iRowEnd,iColStart,iColEnd);
        }
        outString1 += outString2;

        if (m_StutterDirection == HORIZONTAL_STUTTER)
        {
                outString2="Direction is Horizontal\n";
        }
        else
        {
                outString2="Direction is Vertical\n";

        }
        outString1 += outString2;

        outString2.Format("Total Pixels:\t%d\nReplaced Pixels:\t%d\nStutter Count:\t%d\nStutterRatio:\t%10.6f,
%e",
                lSize,replacedPixels,nStutter,stutterRatio,stutterRatio);

        outString1 += outString2;
        AfxMessageBox(outString1);

        //Dispose memory
        delete pOutputImg;
        pOutputImg=NULL;


}
```

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SN _09/734751_   Mail Date _12-11-00_

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